

CLAIMS

1. A method for producing a metal casting, comprising:  
providing a metal in a crucible;  
5 melting the metal in the crucible under an inert atmosphere using an arc from an electrode; and  
releasing the molten metal into a mould.
2. A method for producing a metal casting according to claim 1, in which the metal provided in the crucible  
10 comprises at least two parts of different compositions.
3. A method for producing a metal casting according to claim 1 or 2, further comprising stirring the molten metal in the crucible.
4. A method for producing a metal casting according to  
15 claim 3, in which the molten metal is stirred by establishing relative movement between the arc and molten metal in the crucible.
5. A method for producing a metal casting, in which the relative movement is established by oscillating the  
20 electrode.
6. A method for producing a metal casting according to any one of the preceding claims, further comprising agitating the molten metal in the crucible by supplying a pulsating alternating current to the electrode.
- 25 7. A method for producing a metal casting according to claim 6, in which the pulsating alternating current is of varying frequency.
8. A method according to claim 6 or 7, further

comprising superimposing a direct current to alter the balance of the alternating current.

9. A method according to claim 8, in which a positive direct current is superimposed for cleaning the molten metal.

10. A method according to any one of the preceding claims, further comprising varying the pressure of the inert atmosphere during melting.

11. A method according to any one of the preceding claims, further comprising heating the mould prior to pouring the molten metal.

12. A method according to any one of the preceding claims, further comprising introducing a pressure differential between the crucible and the mould to encourage molten metal flow from the crucible to the mould when pouring commences.

13. An item of jewellery cast in accordance with any one of claims 1 to 12.

14. Apparatus for producing a metal casting, comprising a crucible, means for establishing an inert atmosphere around metal in the crucible, an electrode, means for supplying electricity to the electrode to generate an arc for melting metal in the crucible, and a mould for receiving molten metal from the crucible.

15. Apparatus according to claim 14 further comprising means for stirring molten metal in the crucible.

16. Apparatus according to claim 15, in which the stirring means establishes relative movement between the

arc and molten metal in the crucible.

17. Apparatus according to claim 16, in which the stirring means comprises drive means for oscillating the position of the electrode.
- 5 18. Apparatus according to any one of claims 14 to 17, in which the electricity supply means supplies high frequency alternating current to the electrode.
19. Apparatus according to claim 18, further comprising means for superimposing a direct current to alter the  
10 balance of the alternating current.
20. Apparatus according to any one of claims 14 to 19, further comprising means for varying the pressure of the inert atmosphere established.
21. Apparatus according to any one of claims 14 to 20,  
15 further comprising a conduit communicating between the crucible and the mould, and having a valve for regulating molten metal flow through the conduit.
22. Apparatus according to claim 21, further comprising means for establishing a pressure differential across the  
20 valve for urging molten metal flow through the conduit when the valve is open.
23. Apparatus according to claim 22, in which the pressure differential establishing means comprises suction means for reducing gas pressure in the mould.
- 25 24. Apparatus according to any one of claims 14 to 23, in which the electrode is a tungsten electrode.
25. Apparatus according to 24, in which the tungsten electrode is part of a tungsten arc torch.